



Human Factors

research and technology division



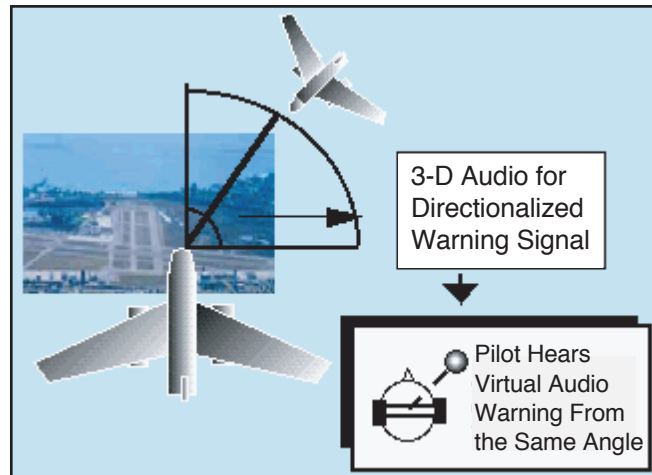
Spatial Auditory Displays for Aviation: □ Traffic and Ground Collision Avoidance Signals

Objective

To enhance aviation safety by decreasing target acquisition time and maintaining visual out-the-window contact and vigilance.

Approach

Enhance existing traffic collision avoidance systems (TCAS) and create ground collision avoidance system using well-localized sound sources displayed spatially through pilot's headset. Alerts such as "traffic-traffic" appear in the out-the-window direction of the target, augmenting symbology on a head-down map display. The



technology allows the visual system to keep gaze out-the-window on other tasks, thereby increasing the margin of safety in both ground and air operations.

Impact

Overall, 3-D audio displays will enhance safety and performance by augmenting existing TCAS systems, demonstrating up to a 2.2 second advantage for target acquisition. Augmenting existing TCAS systems with 3-D audio cues, rather than building a new display system from the "ground up," is both unique and inexpensive to implement.

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